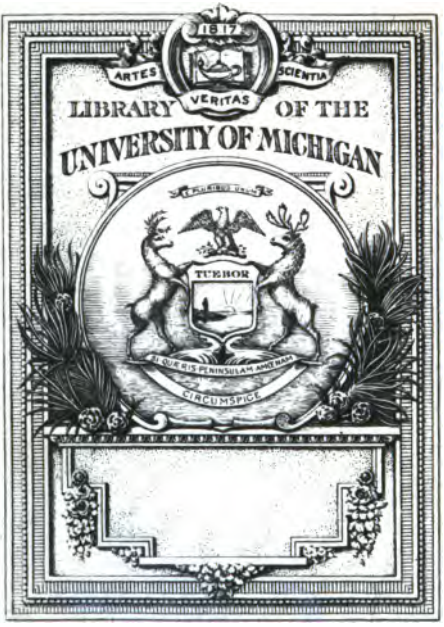
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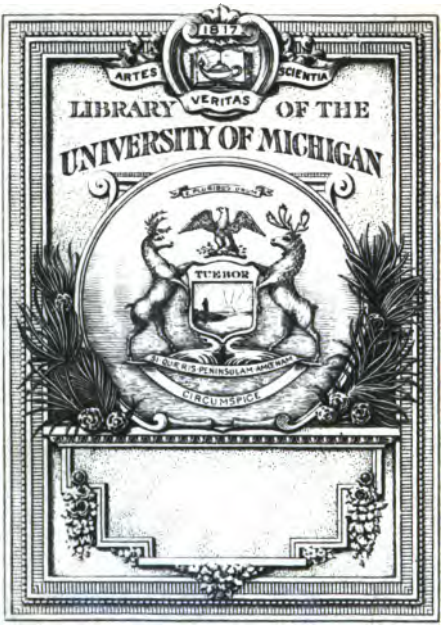
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CATECHISM

OF

General Knowledge ;

OR, A BRIEF

INTRODUCTION

TO THE

ARTS AND SCIENCES.

FOR THE USE OF

SCHOOLS AND FAMILIES.

BY WILLIAM MAVOR, LL. D.
AUTHOR OF TRAVELS, AND MANY
OTHER POPULAR WORKS.

With Alterations and Improvements.

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PREFACE.

IN prosecution of his design of compiling a series of CATECHISMS, on some of the more important branches of education, it occurred to the author, that one embracing the general principles of HUMAN KNOWLEDGE, could not fail to be acceptable, especially to those who had little time or opportunity for study; and that to others in happier circumstances, it would furnish useful hints, and stimulate to further inquiry.

Perhaps no work within the same compass, ever included so many subjects; and though it was impossible, within the limits prescribed, to enter into details, it is hoped that the definitions and explanations, will be found correct as far as they go, and that every thing will tend to improvement or instruction.

The Alphabetical mode of arrangement, as it facilitates reference, will render this a Dictionary of Arts and Sciences in Miniature, easy to be committed to memory, and useful to every class of Juvenile readers, for whose service alone it is intended.

WILLIAM MAVOR.

CATECHISM.

Agriculture.

1. Q. What is Agriculture ?

A. It is the art of cultivating the ground, and rendering it fruitful.

2. Q. Is it not one of the most useful of all sciences ?

A. It certainly deserves to hold the first rank in human arts ; and, in fact, it is the source of all the rest, as without it we could not subsist. Food, drink, and clothing, are all produced by it, in their first state.

3. Q. Does it not require much knowledge to make a good farmer ?

A. Though many ignorant persons are employed in cultivating the earth; the greater share of knowledge might be usefully applied to this purpose. A really good f——

er should be able to judge of soil at first sight; he ought to know how to prepare it for every variety of crop, whether corn, grass, or wood; the management and feeding of cattle likewise fall under his cognizance; and, in a word, the whole science of rural affairs should be open to his view.

4. Q. Have not great improvements in agriculture been lately introduced into this country?

A. Men of education and fortune, even of the present day, do not think it beneath them to become practical farmers; and the Agricultural Societies have already done much to remove prejudices, and to give currency to useful improvements.

Air.

5. Q. What is Air?

A. It is a transparent, invisible, elastic fluid, surrounding the earth to the height of several miles.

6. Q. Is air absolutely necessary ?

A. Air contains the very principles of life and vegetation : neither animals nor plants could exist without it. In fact, it is one of the four elements : which are, *Air*, *Earth*, *Fire*, and *Water*.

7. Q. Are there not several kinds of air ?

A. The atmospheric air, or the common air we breathe, which is about eight hundred times lighter than water, proves, on analysis, to be an intimate combination of the three aerial fluids, which have hence obtained the names of *Mephitic*, corrupted or phlogistic air ; *Vital*, dephlogisticated, or pure air ; and *Fixed Air*.

8. Q. Please to explain the nature of these three kinds of air.

A. I will with pleasure. The first, singly, extinguishes flame, and would soon destroy life. Without the second, animals could not breathe, nor a candle burn. The third amounts to no more than a sixteenth part of the other two, is specifically heavier,

not only extinguishes flame, but instantly destroys life.

9. Q. Has air any other peculiar qualities?

A. When compressed, it has an amazing power, similar to the explosion of gun-powder; it conveys sound, and is necessary to give us the sense of hearing. In a word, without air, we should have neither music, smell, nor light, nor even be able to converse with each other.

Algebra.

10. Q. What is Algebra?

A. I can only give you a definition of it in this place. It teaches the method of calculating all kinds of quantities, by means of general signs; or, to speak more plainly, it teaches to represent any number at pleasure, by letters of the alphabet.

11. Q. Is this science very useful?

A. Though little studied, except by math-

ematicians, it is no doubt very useful; and has in consequence been distinguished by the name of Universal Arithmetic, or the Arithmetic of Signs.

Anatomy.

12. Q. Be pleased to give me the definition of Anatomy?

A. Anatomy is the art of dissecting bodies when dead, and of examining and arranging their parts, in order to discover the seat and nature of diseases, and thus promote the knowledge of medicine and surgery.

Architecture.

13. Q. What is Architecture?

A. It is the art of planning and erecting all kinds of buildings, according to the best and most approved models.

14. Q. Is architecture a very ancient art?

A. In some form or other, it is probably coeval with man. The Egyptians first

brought it to some degree of perfection; the Greeks very greatly improved it, and indeed we have never been able to surpass them; the Romans gave it a more decorated appearance, but did not always study what is termed chastity of taste; and the Arabs, whose lively imagination could not be subjected to rules, introduced that peculiar kind of architecture, called Gothic, which is frequently seen in houses of divine worship, and other ancient buildings.

15. Q. Are there not several distinct orders in architecture?

A. The ancients invented five, at different times and on different occasions; and we have never been able to add a sixth, which has possessed sufficient merit to be generally adopted.

16. Q. What are the names and characteristics of the orders?

A. The Tuscan, remarkable for its massiveness and simplicity; the Doric, distinguished by its durability and nobleness; the

Ionic, which is a medium between the massive and the delicate, the simple and the rich orders; the Corinthian, the most attractive of all orders, and in elegance the last effort of Grecian architecture; and the Composite, invented by the Romans, and which receives its name from its being composed of the other orders.

17. Q. What is meant by Rustic?

A. The Rustic is not an order of itself, but a method of treating all the orders, as if executed with stones, simply hewn.

18. Q. Is modern the same with ancient architecture?

A. The moderns must forever be indebted to the ancients for the general principles of architecture; but they vary according to taste and circumstances from their great originals, and frequently disfigure what they mean to adorn. In common buildings, convenience alone is regarded.

Arithmetic.

19. Q. What is Arithmetic?

A. It is the art of computing by figures, of which we have *nine* and a *cipher*, invented by the Arabians.

20. Q. How many rules are there in arithmetic?

A. Notwithstanding the great variety of their application, there are only four principal rules, Addition, Subtraction, Multiplication, and Division.

21. Q. What is Addition?

A. It is adding two or more numbers together, so as to find their amount; thus 2 added to 2, make 4: 3 added to 4, make 7.

22. Q. What is Subtraction?

A. It is taking a less number from a greater, in order to show the difference. Thus; 2 from 5, leave 3: 5 from 7, leave 2.

23. Q. What is Multiplication?

A. It is the art of increasing or multiplying one number by another, as often as there are units in the multiplier. Thus twice 2 are 4; 3 times 6 are 18. In this rule, the multiplication-table is of the greatest use.

24. Q. What is Division?

A. It is the art of finding how often one number is contained in another, or of dividing any sum into the number of parts required.

Thus 6 divided by 2, gives 3: 12 divided by 3, gives 4. Multiplication and Division mutually prove each other.

Astronomy.

25. Q. What is Astronomy?

A. It is that grand and sublime science which makes us acquainted with the figures, distances, and revolutions of the heavenly bodies, and with the nature and extent of the universe.

26. Q. How are the heavenly bodies divided?

A. Into those which are luminous, or give light of themselves; and those which are dark or opaque, and consequently receive light from others.

27. Q. Which are the luminous bodies?

A. The sun and the fixed stars, which, occupying the centre of different systems of opaque bodies, communicate light and heat to them.

28. Q. Are there many opaque bodies?

A. We know of none except those which are lighted by the sun; but it is probable that every star has a system of planets round it.

29. Q. What are the bodies that compose our system?

A. The sun, the planets, and their satellites, and the comets.

30. Q. Is not the sun very large?

A. It is one hundred and twelve times larger than the earth, and though it is said to be fixed in the centre of our system, it has a rotation on its axis, which it performs in 25 days 12 hours.

31. Q. What are the names of the planets?

A. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Herschel or the Georgium Si-

dus, Ceres Ferdinandea, Pallas, Juno, and Vesta. The five last are of late discovery.

32. Q. Are all these visible by the naked eye?

A. Only Venus and Jupiter are to be clearly distinguished, without the assistance of glasses.

33. Q. What are satellites?

A. They are bodies which accompany superior planets. The moon is a satellite to our earth. Jupiter has four satellites; some planets have none.

34. Q. Of what figure is the earth?

A. Nearly round. Its diameter from pole to pole being only about 37 miles shorter than at the equator.

35. Does the earth move?

A. The earth turns on its axis every 24 hours, and thereby causes the succession of day and night; and it likewise performs its annual motion round the sun in 365 days, 5 hours, 48 minutes, and 57 seconds, occasioning the different lengths of days and

and nights, and consequently the change of seasons.

36. Q. In what time does the moon perform her revolution round the earth ?

A. In 27 days, 7 hours, and 43 minutes, which make a lunar month.

37. Q. What are the fixed stars ?

A. They are bodies luminous of themselves, like our sun, and the nearest of them is computed to be 400,000 times farther off than the sun.

38. Q. What are comets ?

A. They are bodies which are supposed to revolve round the sun in elliptical orbits, but we know little of them, as the periods of only a few have been ascertained with any degree of precision.

Biography.

39. Q. What is Biography ?

A. Biography records the lives of men, and may be called the science of life and manners.

40. Q. What is its use and object?

A. To teach by example, or to warn by contrast; and, as example is always more powerful than precept, no study is more likely to be serviceable to youth.

Botany.

41. Q. What is Botany?

A. In a general acceptation, it implies a knowledge of the nature, use, and cultivation of plants; but as a modern Science, it applies chiefly to the classification of plants, and enables the botanist to fix the class, the order, the genus, and lastly the species of every vegetable that falls under his view.

42. Q. What are the grand natural families of vegetables?

A. They are three; the herbaceous, the shrubby, and the arborescent, or trees.

43. Q. But are they not classed in a very different manner from this?

A. In artificial systems, of which that by the illustrious Linnæus has obtained almost

universal adoption, the classification is founded on the sexual system, or that which supposes all plants to have male and female organs of generation. This great naturalist divides all vegetables into twenty-four classes; but some of his disciples have reduced them to twenty, in order to simplify the study of this extensive science, of which I cannot on this occasion furnish you even with the outline.

44. Q. What is the use of botany?

A. It is not only one of the most agreeable amusements to discover and to be able to name plants, but it is likewise of the utmost consequence in domestic economy, in medicine, and in various arts and manufactures; as vegetables are applicable to a thousand different uses.

45. Q. Please to name some of the most curious and valuable vegetables.

A. It is impossible in this place to enumerate more than a few. I shall, however, particularize wheat, rye, Indian corn, buck-

wheat, &c. which belong to gramineous plants; the sugar-cane, the oak, the vine, the coffee-tree, the tea-tree, the cocoa-tree, tobacco, Brazil-wood, mahogany, cotton, pepper, cinnamon, hemp, and flax, of which last linen is made.

Chemistry.

46. Q. What is Chemistry?

A. Chemistry is the science which explains the constituent principles of bodies, the results of their various combinations, and the laws by which those combinations are produced.

47. Q. Chemistry must then be a science of great extent!

A. Its objects extend to all nature; and though it has been cultivated with the greatest success in modern times, new discoveries are continually making, and will continue to be made.

48. Q. How may the bodies or objects in which Chemistry is conversant be divided?

A. Into four parts; first, such as are considered as simple; secondly, such as are formed by the union of two simple bodies; thirdly, such as are formed by the union of two compound bodies; and fourthly, bodies as they are presented to us in the animal, vegetable, and mineral kingdoms.

49. Q. What are the chief divisions of simple bodies?

A. All simple bodies, or those which are considered as such, may be reduced into six classes; oxygen, simple substances, metals, earths, caloric, and light.

50. Q. What is oxygen?

A. It is a principle existing in the air, of which it forms the respirable part, and it is likewise necessary to combustion.

51. Q. What are simple substances?

A. Such as are capable of combustion or burning, and they are only five, sulphur, phosphorus, carbon, hydrogen, and azote.

52. Q. What are metals?

A. The metallic substances at present

known are twenty-three in number; gold, platina, silver, mercury, copper, iron, tin, lead, nickel, zinc, bismuth, antimony, tellurium, arsenic, cobalt, manganese, tungsten, molybdenum, uranium, titanium, cromium, columbium, and tantalium. Of these, the ten first are malleable, or capable of being extended under the stroke of a hammer; the next four are brittle and easily fused; and the rest are brittle, but fused with difficulty.

53. Q. What are earths?

A. Earths are insipid substances, nearly insoluble, often dry, and sometimes soft to the touch; they are barytes, strontian, lime, magnesia, alumina, yttria, glucina, zirconia, and silica.

54. Q. What is caloric?

A. Caloric is the cause of heat, or is that exquisitely elastic fluid by which heat is produced.

55. Q. What is light?

A. It is a substance composed of small

particles, moving from luminous bodies in straight lines with inconceivable rapidity, and is the cause of colour.

56. Q. Into how many classes may compound bodies be reduced?

A. Into the following five—water, alcohol, oils, alkalies, and acids.

57. Q. How many classes are there in compound bodies?

A. Three—soaps, neutral salts, and hydro-sulphurats. But for further information on the subject of chemistry, reference must be had to Parke's Rudiments of Chemistry.

Chronology.

58. Q. What is Chronology?

A. It teaches the method of computing time and distinguishing its parts, so as to determine how many years have elapsed since any memorable event.

59. Q. What chronology is most ancient?

A. That of Moses, by which it appears

that the creation of the world took place 4004 years before the birth of Christ; hence by adding the current year to the years before mentioned, we find the duration of the world.

60. Q. Have all nations adopted the same chronology?

A. No; the Greeks computed time by Olympiads, or periods of four years; the Romans by the number of years from the building of their Capital, which took place in the 752d year before the birth of Christ; and the Mahometans compute from the Hegira, or flight of Mahomet frem Mecca, which happened in the year of the Christian era 622.

Clouds.

61. Q. What are clouds?

A. Clouds are nothing but a collection of vapours, condensed and suspended in the air, and are generally from a quarter of a mile to two miles high. As the air is lighter

in proportion to its distance from the surface of the earth, none but the light clouds can sustain themselves at a certain height. The thick clouds which are ready to dissolve in rain, are commonly low.

62. On high mountains then we are above the clouds ?

A. Q. Yes : in mountainous countries, it is nothing unusual to see the clouds pouring down in rain in the vales, and at the same time to be enjoying sun-shine on the summit of the mountains.

Commerce.

63. Q. What is Commerce ?

A. It is the art of exchanging one commodity for another by buying or selling ; and though it has its origin in private emolument, it is the bond of nations, as by it one country participates in the advantages of another.

The whole world is a grand store house for man ; and what one nation wants, another supplies.

Cosmography.

64. Q. What is Cosmography ?

A. It means a description of the world or universe, including the earth and infinite space. It naturally divides itself into two parts, Geography and Astronomy.

Dew.

65. Q. What is Dew !

A. It is produced from extremely subtile particles of water floating in the air, and condensed by the coolness of the atmosphere.

66. Q. Is the evening dew the same as the morning ?

A. Not exactly. The evening dew is produced by the watery particles exhaled by the heat of the sun, condensing and falling towards the earth ; the morning dew arises partly from the perspiration of the plants themselves, and partly from the aqueous particles of the evening dew, dilated by the warmth of the rising sun, and being deposited in drops. This may be proved by cov-

ering a cabbage with a bell at night: in the morning the covered cabbage will have drops like the rest, while the bell itself will have recived the falling dew.

Drawing.

67. Q. What is Drawing?

A. It is the art of representing on a flat surface, the form or figure of any body, house, tree, or other object.

68. Q. How is this art acquired?

A. By studying perspective, by the instructions of a master, and by practice, aided by a natural genius.

Eclipses.

69. Q. What is an Eclipse?

A. It is the total or partial privation of the light of one of the heavenly bodies, by the interposition of another. Though any of the planets may be eclipsed, the sun and moon are chiefly regarded.

70. Q. When do eclipses of the sun happen?

A. When the moon is between the sun and the earth. In that position it intercepts wholly, or in part, the rays of the sun. When the eclipse is total, we see the stars as at night.

71. Q. What occasions eclipses of the moon?

A. The position of the earth between the moon and the sun; for the moon having no light of herself, can only be illuminated by the sun.

72. Q. Can it be known before-hand when eclipses will happen?

A. With the greatest accuracy astronomers can fix the commencement and duration of every eclipse.

Electricity.

73. Q. What is Electricity?

A. It is a power in nature which shows itself by friction, with the naked hand, or with some animal or metallic substance.

74. Q. What effects does it produce?

A. It is capable of attracting and repelling light bodies, of emitting luminous rays, producing brilliant sparks, causing violent commotions or shocks, and setting fire to inflammable vapours and spirituous liquors.

75. Q. Of what nature is electricity?

A. In all its powers and properties it resembles lightning, and has been known to occasion the same effects, where the experiment has been conducted on a large scale.

76. Q. What is meant by conductors of electricity?

A. Bodies through which the electric fluid can pass, such as metals, are called conductors of electricity; and those bodies through which it cannot pass, as glass, rosin, sealing-wax, sulphur, bees-wax, baked wood, oils and air, are called non-conductors. However, all substances, when made very hot, become conductors. Conducting substances, are called non-electrics, and non-conducting substances, electrics.

77. Q. I have heard of a body being charged, what does it mean?

A. When a body is possessed of more, or retains less than its natural share of electricity, it is said to be *charged*. If *more*, it is *positively* electrified; if *less*, it is *negatively* electrified.

78. Q. What is meant by an insulated body?

A. When a body is electrified or charged, and surrounded with other bodies through which it cannot pass, it must remain overloaded, and is then said to be insulated.

79. Q. By what instruments are the electrical phenomena produced?

A. By various instruments and substances, by the proper application of which electricians can perform many curious experiments, and explain the effects of lightning. Electricity has likewise been applied to the cure or relief of several kinds of diseases, to accelerate vegetation, and to other purposes.

Earthquakes.

80. Q. What is an Earthquake?

A. An earthquake is a sudden motion of the earth, supposed to be caused by the explosion or discharge of the electrical power, or, as some think, by the action of water heated by subterraneous fires; for it must be observed, that the surface of the earth is like a crust, under which are many cavities containing water, air, and fire, which sometimes occasion very violent convulsions.

81. Q. Are earthquakes frequent?

A. Happily they are less frequent than it appears they were in the earlier ages of the world; but still they occur not uncommonly in the more southern regions of the world.

82. Q. What is a volcano?

A. It arises from subterraneous fires, constantly acting, and appearing like smoke, and sometimes fire from a chimney. Etna, in

Sicily, Vesuvius in Naples, and Hecla, in Iceland, are the most considerable in the world. Many volcanoes are now extinct.

Ethics.

83. Q. What are Ethics?

A. Morality or ethics is the science of manners and duty, and teach the proper conduct of men, according to their respective situations.

An adherence to the doctrines of Christianity, laid down by Christ himself, and influenced by the holy spirit on the mind of Man, is the source of moral obligations and every duty: without this superior rule of action, all systems of morals are dry and of little interest.

Frost.

84. Q. What occasions Frost?

A. It is the effect of cold, and is generally

produced by the wind blowing from a cold quarter.

85. Q. How is ice formed?

A. By an extraordinary degree of cold, which congeals the water into a firm substance.

86. Q. Do we derive any advantages from frost?

A. It clears the atmosphere of noxious vapours, braces the human frame, mellows and fertilizes the soil, destroys insects, and serves other useful purposes.

Galvanism.

87. Q. What is Galvanism?

A. It is a power in nature which shows itself by the chemical action of certain bodies on each other, and derives its name from Dr. Galvani, of Bologna, who first explained the principles upon which it is founded, and published many curious experiments on this subject; from which it appears that galvan-

ism bears near relation to electricity.

88. Q. Give me an easy example of galvanism.

A. Put a piece of zinc between the upper lip and the gums, place a half-crown or guinea on the tongue, and bring the metals into contact, when you will see a faint flash of light.

89. Q. Is galvanism applied to any useful purposes?

A. It is probably a science more curious than useful, and has been prosecuted and established by many cruel and disgusting experiments on frogs and other animals.

Geography.

90. Q. What is Geography?

A. It is that science which makes us acquainted with the constituent parts of the globe, and its distribution into land and water. It also teaches us the limits and boundaries of countries, and their peculiarities, natural and political. In short, it is the eye and key of history. On this subject we must

be brief here, and refer our reader to the Catechism on Geography.

Geometry.

91. Q. What is Geometry ?

A. It is that sublime science, which teaches the relations of magnitude, and the properties of surfaces. In an extended sense, it is the surface of demonstration, and includes the greater part of the mathematics.

92. Q. To whom is geometry particularly useful?

A. Geometry, which, in its original acceptation, means the measuring of land, because it was first applied to that purpose by the Egyptians, is indispensable to architects, and in general to all who have any concern in building, or mechanics ; and as it accustoms us to a just mode of reasoning in every thing, it may be cultivated to advantage by every person.

Grammar.

93. Q. What is Grammar ?

A. It is the art of speaking and writing

correctly, according to the genius of any language.

94. Into how many parts is grammar divided?

A. Into four: orthography, etymology, syntax, and prosody.

95. Q. What is orthography?

A. It is the art of spelling truly, according to established usage.

96. Q. What is etymology?

A. Etymology treats of the different sorts of words, their various modifications and derivations.

97. Q. What is syntax?

A. It is the agreement and right disposition of words in a sentence.

98. Q. What is prosody?

A. It teaches the true pronunciation of words, and likewise the laws of versification.

Hail.

99. Q. What is Hail?

A. It is formed by drops of rain, which

passing through the cold regions of the atmosphere, congeal as they fall. Hence, hail should be of the same size as drops of rain; but should the cold be sufficiently intense to freeze the particles of water in their descent; or when several hail stones unite, the hail stones then acquire a size equal to that of a walnut, or even an egg, and occasion much destruction where they fall. Such hail storms are most common with thunder, and are produced by a sudden congelation.

History.

100. Q. What is History?

A. It is a narration of past facts and events, relative to every age and nation; and this forms the guide of the statesman, and is the favourite study of the enlightened scholar.

101. Q. How is history divided?

A. With regard to its subject, it may be divided into general and particular. Gen-

eral history relates to the affairs of all nations; particular history, to individual countries.

102. Q. But are there no other divisions of history?

A. Yes. With regard to time, it is divided into ancient and modern. Ancient history commences with the creation of the world, and is usually carried down to the reign of Charlemagne, in the year of our Lord 800. Modern history commences with that period, and reaches down to the present time.

There are likewise other subdivisions of history. General history embraces sacred, ecclesiastical, and profane history.

103. Q. What is sacred history?

A. It is the history of religion before the birth of Christ, and includes the whole of the Mosaic dispensation, which is to be read only in the best and most ancient of books, the Bible.

104. Q. What is ecclesiastical history?

A. It relates the affairs of the Christian church, comprehending the lives and sentiments of those who have maintained the orthodox faith, as well as of sectaries who have deviated from it, and infidels who have opposed it.

105. Q. What is profane history?

A. It includes the narrative of events and transactions relative to all nations, in a civil, political, and military point of view, not written by inspired authors, and who are therefore, by way of distinction, called profane; and this, as I have already said, is divided into ancient and modern history.

Hydraulics.

106. Q. What is the meaning of Hydraulics?

A. Hydraulics is the science which treats of the motion of fluids, or those substances whose parts yield to any impression, and, in yielding, are easily moved amongst each other.

107. Q. To what purpose is this science applied ?

A. To explain and define the principles, by which water is conducted from one place to another by means of canals, aqueducts, pumps, and other hydraulic machines, which are of the utmost consequence to the comforts and conveniences of mankind.

Hydrostatics.

108. Q. What is Hydrostatics ?

A. It is that science which refers to the weight and actions of fluids.

109. Q. What is the reason that some bodies, as stones, will sink in the water, while others, as woods, will remain suspended ?

A. A body heavier than an equal quantity of any given fluid, will sink in that fluid ; but if it be lighter, it will swim on its surface. If of the same gravity or weight, it will neither sink nor swim, but remain suspended in any part of the fluid.

Jurisprudence.

110. Q. What is Jurisprudence ?

A. Jurisprudence teaches the knowledge of the laws, and of every thing connected with the administration of justice, without which, society cannot be preserved in peace and order.

Language.

111. Q. What is meant by Language ?

A. The terms and modes of speech used by different nations which vary extremely ; though till the dispersion of mankind, on their attempting to build the tower of Babel, we are told there was only one language.

112. Q. How are languages divided ?

A. Into those which were formerly spoken, now called dead languages, as Latin, Greek ; and into living languages, or such as are used by modern nations.

Logic.

113. Q. What is Logic ?

A. Logic is the art of employing reason efficaciously in inquiries after truth, and in communicating the result to others.

114. Q. Into how many parts is logic divided ?

A. Into four parts ; simple apprehension, judgment, reasoning, and method.

115. Q. What is simple apprehension ?

A. Simple apprehension, or perception, is the first operation of the mind, and is the power of acquiring simple ideas, as a *man, a horse, happy, miserable,* &c.

116. Q. What is judgment ?

A. After mind has acquired ideas, the next step to knowledge is being able to compare these ideas together ; and this is called judgment.

117. Q. What is reasoning ?

A. When we cannot judge of the truth or falsehood of a proposition without determining the relation between any two ideas by the intervention of a third, with which they

may be compared, we then have recourse to reasoning.

118. Q. What is method?

A. It is the faculty of arranging our thoughts in such a manner, that their mutual connection and dependence may be clearly seen.

Magnetism.

119. Q. What is Magnetism?

A. It is that quality or constitution of a body and its pores, by which it is rendered capable of turning to the pole, when suspended, and left at liberty to move freely, and also of attracting iron.

120. Is not this performed by the loadstone?

A. Yes, the loadstone, or magnet, which, in its natural state, is a hard, mineral body, and is proved to be an ore of iron, produces these wonderful effects, and is capable of communicating them to iron and steel: in fact, the magnets generally used are all artificial.

121. Q. To what useful purpose is magnetism applied?

A. As the magnet points to the North, the mariner's compass is so formed, as to enable seamen to conduct their vessels from port to port, over the pathless ocean; and by this directive property, it also guides miners in their subterraneous works, and travellers through deserts, otherwise impassable. In a word, without it, navigation could never have acquired its present state of perfection. It is only about 500 years, however; since the magnet was first known, nor is it ascertained to whom mankind are indebted for this grand discovery.

Man.

122. Q. What is the noblest work of God on earth?

A. Man; who, though he differs little in construction from some animals, is supereminently distinguished from all, by the powers of reason, and by the immortality of his soul.

123. Q. What are the principal states of life though which a man passes ?

A. They are four: infancy, youth, manhood, and old age.

124. Q. What is the situation of man in his first state ?

A. He comes into the world naked and helpless, and must be reared with care and attention. His life for the first two or three years is very precarious: by degrees he acquires strength, and his faculties begin to open, when the aids of education must be diligently applied, to render him wise and good.

125. Q. At what period does youth begin ?

A. About the age of fourteen, and the preceding stage is termed infancy and childhood, though few persons have attained their full size till they are eighteen or nineteen, and some continue to grow till after twenty-one. About thirty, all the proportions of the body arrive at the high-

est perfection. Women at an earlier date; in the latter, the limbs are rounder, the expression softer, and the features more delicate.

126. Q. Is not manhood the best period of life?

A. At that period a person enjoys all the faculties of both body and mind, in the greatest perfection; and between thirty and fifty years of age, he is best qualified for the discharge of the various duties of life, according to his station, talents, and the education he has received.

127. Q. When does old age commence?

A. At fifty, and in some persons more early, according to constitution and manner of life. Temperance, exercise, and the practice of virtue, generally will retard the approach of old age; while their opposites will hasten, what nothing can long remove,—decay and death.

128. Q. Are all mankind of the same family?

A. From Scripture we learn that all sprang from Adam and Eve; but climate, food and manners, have had considerable influence on the human race; and naturalists commonly divide them into six great families: 1. The inhabitants of the polar regions, Laplanders, Greenlanders, &c. &c. 2. The Tartar race, who inhabit a very considerable portion of Asia. 3. The southern Asiatics, and the nations of the islands in the Southern Ocean. 4. The negroes of Africa. 5. The Aboriginal Americans. 6. The natives of Europe, and those of European extraction, which hold the most elevated rank in the scale of being.

Maps.

129. Q. What are Maps?

A. A representation on a plane surface, of the earth, or some particular part of it, according to the laws of perspective and astronomy, in which the situations of coun-

tries and their appendages ought to be accurately laid down.

130. Q. How is the bearing of a map to be ascertained?

A. When not otherwise specified, the top of the map is north, the bottom south, the right hand east, and the left west.

Mechanics.

131. Q. What are Mechanics?

A. Mechanics teach the nature and laws of motion, the action and force of moving bodies, and the construction and effects of machines and engines. Mechanics may be practical or rational: the former is most useful.

132. Q. Are there not certain powers called mechanical powers?

A. Yes: the mechanical powers are certain simple machines, which are used for raising greater weights, moving heavier bodies, or overcoming greater resistances than the natural strength of man could accom-

plish: they are as follow: the *lever*, the *wheel*, and the *axle*, the *pulley*, the *inclined plane*, the *wedge*, and the *screw*; by means of which, the most wonderful effects may be produced.

133. Q. Are these mechanical powers all of equal utility?

A. They may in fact, all be reduced to two, the *lever* and the *inclined plane*; for the pulley and the wheel, are only assemblages of levers, and the wedge and the screw are inclined planes.

Medicine.

134. Q. What is Medicine?

A. Medicine or the art of healing, consists in the knowledge of the disorders to which the human body is subject, and in applying proper remedies to remove or relieve them.

135. Q. To whom does the practice of medicine belong?

A. It belongs solely to those who have studied it as a profession; for though every

person ought to acquire a knowledge of health, and the art of preserving it,* the application of medicine is dangerous in the hands of ignorance.

Metaphysics.

136. Q. What are Metaphysics?

A. Metaphysics may be considered as the science of mind. It treats only of abstract qualities; and therefore can never lead to absolute certainty.

Meteors.

137. Q. What are Meteors?

A. Meteors are moving bodies appearing in the atmosphere, and supposed to be occasioned by electricity. Of this kind are the aurora borealis, or northern lights, which sometimes appear so beautiful; falling stars, as they are called, which are chiefly seen

* For some useful information on this important subject, see the "Catechism of Health."

in clear and calm weather; and will-with-the-whisp, or jack-a-lantern, a meteor sometimes seen about bogs and swampy places, seldom more than six feet from the ground, and darting from place to place.

Mineralogy.

138. Q. What is Mineralogy?

A. It is the science which teaches us to describe and arrange the solid and inanimate materials, of which the globe of the earth is composed.

139. Q. Into how many classes are minerals divided?

A. They are usually arranged under four classes,—the earthy, the saline, the inflammable, and the metallic.

140. Q. What are the principal substances of which the first class is composed?

A. The prinbipal substances which compose the first class are stones, crystals, calcareous spars, precious stones, and gems.

141. Q. What are the principal substances in the second, or saline class?

A. The fossil salts which are all of easy solution, are, mineral alkali, common salt, borax, sal-ammoniac, nitre, alum, and vitriol.

142. Q. What are the characters of the third, or inflammable class?

A. The inflammable class of minerals are light, brittle, and mostly opaque: they consist of sulphur, coal, jet, graphite, mineral charcoal, and amber.

143. Q. What are the characters and principal substances of the metallic class?

A. Metallic minerals are heavy, generally opaque, malleable, and exhibit colours of a peculiar lustre: the chief are platina, gold, mercury, silver, copper, iron, lead, tin and zinc.

144. Q. What are the most valuable metals?

A. Gold and Silver are valued most, but iron is vastly more useful, and extremely necessary.

Mists.

145. Q. From what cause do mists proceed?

A. Mists are a collection of vapours, commonly rising from fenny places or rivers, and becoming more visible as the light of the day decreases. When a mist or fog ascends high in the air, it is called a cloud.

Music.

146. Q. What is Music ?

A. An agreeable and very fascinating luxury; useless to any real purpose of life, but extremely gratifying to the ear. It consists of *melody*, or a series of sounds arranged with grace, and within the compass of the voice; *harmony*, which is a coincidence of two or more sounds heard together; and *dissonance*, which is the want of that agreeable harmony between two or more sounds, which constitute harmony.

147. Q. Is not music much cultivated in this country ?

A. It certainly is cultivated much more than it deserves, and frequently at the expense of more valuable acquisitions.

Mythology.

148. Q. What is Mythology?

A. It is the science of fabulous history, or of the stories invented by the ancient pagan poets and philosophers, in honor of their gods and heroes.

149. Q. Is Mythology a necessary study?

A. Without an acquaintance with Mythology, it would be impossible to read the Greek and Latin classical writers to advantage, or to understand them. But it is to be lamented that such corrupt publications as the common heathen mythology, should be put into the hands of innocent youth.

Natural History.

150. Q. What is Natural History?

A. This very extensive science includes a description of the forms and instincts of animals, the growth and properties of vegetables and minerals, and whatsoever else is

connected with nature. The three principal sciences included in natural history, are botany, zoology, and mineralogy.

Navigation.

151. Q. What is Navigation?

A. Navigation is the art of conducting ships on the sea, from one port to another; and besides being furnished with the mariner's compass, every person that has the charge of a vessel, must have some knowledge of practical mathematics.

Optics.

152. Q. What are Optics?

A. The science of vision, whether performed by the eye, or assisted by instruments. It explains the manner in which vision is affected, assigns the reason of the various alterations which the rays of light undergo in the eye, and shows the causes of objects appearing, under different circumstances, greater or smaller, nearer or more remote.

153. Q. What are the principal instruments used in optics ?

A. Lenses, telescopes, microscopes, mirrors, camera-obscuras, and several others.

154. Q. I think it is said that light is the cause of colours; how many colours are there ?

A. There are only seven primitive colours,—red, orange, yellow, blue, indigo, and violet. All the other shades are but mixtures or modifications of these. This may be proved by a prism.

155. Q. Why are not white and black reckoned colours ?

A. Because black is the absence of all colours, and white the union of all.

Painting.

156. Q. What is Painting ?

A. That art, which, by lines and colours, represents on a single surface all visible objects. The basis of this, which forms one of the fine arts, are composition, drawing, and colouring.

157. Q. How many kinds of painting are there?

A. There are eight,—distemper, fresco, painting in oil, crayons, encaustic painting, cameo, enamel, and miniature painting, which last is nearly the same as painting in distemper, though managed with much more delicacy.

Pharmacy.

158. Q. What is Pharmacy?

A. It is the science of the apothecary; and teaches the choice, preparation, and mixture of medicines, according to their intention.

Philosophy.

159. Q. What is Philosophy?

A. Philosophy, properly speaking, is the science of wisdom. A person who studies nature, morals, and the principles of reason, is called a philosopher.

Physics.

160. Q. What is meant by Physics?

A. Physics treat of nature, and explain the phenomena of the material world.

Physiology.

161. Q. What is Physiology?

A. By Physiology, is usually understood the knowledge of those actions which are constantly going on in a living body, and of the organs by which they are performed. Or, it may be called the science which describes the construction and economy of animal bodies.

162. Q. What is the most perfect of animals?

A. Man: created in the image of God, and endowed with faculties, which, if properly cultivated, exalt him infinitely above all other mortal creatures in this world.

Physiognomy.

163. Q. What is Physiognomy?

A. A science founded on no very firm grounds, which teaches or pretends to teach the knowledge of the powers and dispositions of men, by the different features and lines of their faces, form, &c.

Pneumatics.

164. Q. What are Pneumatics?

A. Pneumatics teach a knowledge of the properties of air.

165. Q. Name some of those properties.

A. Air is a thin, transparent, compressible, and dilatable fluid, surrounding the whole earth, and rising several miles above it. Clouds and vapours float in it; and the whole is called the atmosphere. But I have already given you some account of the nature and qualities of air.

Poetry.

166. Q. What is Poetry?

A. Poetry is a speaking picture, representing real or fictitious events, and circum

stances, by a succession of mental imagery, generally delivered in measured numbers, called verse.

167. Q. Can a person be taught to be a poet?

A. No: he must be born one; his imagination must be vivid and extensive, and his taste correct from nature; though unquestionably all those gifts may be very essentially improved by education and practice.

168. Q. What names are given to the different kinds of poetry?

A. Lyric poetry is that of odes and songs; dramatic poetry, for tragedies and comedies; epic poetry, for reciting the actions of gods andheroes; didactic poetry, for teaching morality and science; and sacred poetry, for religious subjects.

Printing.

169. Q. What is Printing?

A. This ingenious and highly useful art, which was not invented till the fifteenth

century, teaches the arrangement of moveable characters, each of which represents a letter of the alphabet. Hence, it follows from this arrangement, and the assistance of a press, which passes over, and presses upon these characters, that one side of a sheet of paper is printed at one stroke, into whatever number of pages it may be divided.

170. Q. Is there not a more modern kind of Printing?

A. Stereotype printing, or printing from pages of fixed letters, is a modern invention, though the idea of it is naturally taken from block printing, or cutting the letters in wood or metal; but this can never be applied to any useful purpose, except for printing books in which neither alteration or variation is intended to be made.

Rain.

171. Q. What is rain?

A. Rain is produced from clouds, con-

densed by the cold, which falls in drops, in consequence of their own weight. When rain falls in torrents, as is usual in thunder storms, it is most probably impelled by the attraction of electricity.

Rainbow.

172. Q. What occasions the Rainbow?

A. The rainbow is produced by the refraction and reflection of the sun's beams from falling drops of rain. Thus the seven primitive colours are exhibited the same as in a glass prism.

173. Q. But may not the rainbow be artificially imitated?

A. An artificial rainbow may be produced by means of a garden engine, if the water is thrown in a direction contrary to the sun, when the air is free from clouds.

Religion.

174. Q. What is meant by Religion?

A. Religion is that tie which connects us

with Heaven; or, in other words, it is the worship offered to the Supreme Being, according to light afforded, in the manner that we conceive to be the most agreeable to his will, in order that we may procure his favour, and escape his displeasure.

175. Q. Is not religion then the most important of all duties?

A. By study we may become learned, by the constant exercise of reason, we may become wise; but without religion, we can neither be happy here, nor hereafter.

176. Q. How are we to acquire due notions of religion?

A. By studying the revealed will of God, in the Holy Scriptures, and attending to the Heavenly Monitor, placed in the breast of every human being.

Rhetoric.

177. Q. What is Rhetoric?

A. It is the art of speaking and writing with such a degree of elegance and dignity,

as may instruct, persuade, and please our hearers and readers.

178. Q. In what does elegance of language consist?

A. In its purity and perspicuity, for unless we select appropriate words and phrases, and evince a clear conception of our subject, we shall not be likely to affect others.

179. Q. In what does the dignity of expression lie?

A. In the use of sublime thoughts, noble tropes, and moving figures.

180. Q. What is the distinction between tropes and figures?

A. Tropes affect and alter single words; figures whole sentences. The first is a word removed from its natural to a relative sense: the latter is an emphatical and ornamental mode of diction, calculated either to inspire passion, or to afford pleasure, by its novelty and beauty.

Sculpture.

181. Q. What is Sculpture ?

A. It is the art of carving or hewing stone and other hard substances, into the representation of animate or inanimate objects ; and this may be either done in the proportions of nature, or in different kinds of relief.

Snow.

182. Q. What is Snow ?

A. It is an assemblage of small and very fine icicles, formed by a congelation of clouds at the instant of their condensation and before the watery particles could unite in drops. These little icicles, slightly uniting in great numbers, fall in light flakes, which, reflecting the light from every part, exhibit the most delicate white appearance.

Surgery.

183. Q. What is Surgery ?

A. It is that branch of the healing art, which consists in manual operations, by the help of different instruments, or in curing wounds by suitable applications; and when conducted by skilful practitioners, is liable to less uncertainty, than the administration of medicine.

Theology.

184. Q. What is Theology?

A. It is that sublime science which contemplates the nature of God, and of divine things.

Thunder and Lightning.

185. Q. What is the cause of Thunder and Lightning?

A. These awful phenomena are the effects of electricity. A cloud electrified, meeting with another not electrified, a great electric flash is produced, accompanied with a loud noise. Should this electric cloud, however, instead of communicating a spark

against another cloud, come in contact with a terrestrial object, at a suitable distance, fire is discharged in a concentrated form, which is usually called a thunder-bolt.

186. Q. Thunder and lightning then usually accompany each other?

A. They do; though we may not always hear the thunder from its great distance. In fact, thunder and lightning bear the same relation to each other, that the flash and report of a cannon do; and by the space of time which intervenes in both cases, we may calculate their distance, allowing 1142 feet for every second of time.

187. Q. What is a Lightning Conductor?

A. Nothing more than a pointed metal rod, placed at the top of a building, and leading to such a spot in the earth, as is likely to prevent danger, should the rod attract the lightning.

Tides.

188. Q. What is meant by the Tides of the sea?

A. The tides are a periodical flow and ebb of the sea, every six hours. High water, is the term applied to the flow at its greatest extent; and low water, when the sea has ceased to retreat.

189. Q. What occasions this phenomenon?

A. The tides are occasioned by the united attraction of the moon and sun upon the waters; but to explain the principles of this, would lead me out of your present depth.

190. Q. What benefits arise from the ebb and flow of the sea?

A. Providence, in its wisdom and benignity, generally acts by second causes. The attraction I mentioned is a second cause; but the effect is, by this constant motion of the waters, to preserve them from putrefaction.

Trigonometry.

191. Q. What is Trigonometry?

A. It is the art of measuring the sides

and angles of triangles, or three-sided figures, whether plain or spherical. Hence, every triangle consists of six parts, three sides, and three angles, and it is necessary that three of these should be given, to find the other three.

192. Q. To what particular purposes is Trigonometry applied?

A. Without it, the mathematician and astronomer would find it difficult or impossible to solve many important questions.

In astronomy, navigation, surveying, dialling, and geography, its application is of incalculable use; and operations in this science, are much facilitated by logarithms, or artificial numbers.

Versification.

193. Q. What is meant by Versification?

A. It is the art of arranging words and syllables in such a manner, as to produce the harmony which constitutes poetry.

194. Q. Are there not different kinds of verses?

A. Verse may consist, according to the species of poetry, of various measures, and it may be either blank or rhyme. In rhyme, the two last syllables, correspond in sound, in blank verse this is disregarded.

Wind.

195. Q. What is Wind?

A. It is a motion of the air, whereby a certain portion of the atmosphere is pushed from one place to another, with more or less velocity; sometimes in the direction of one quarter, sometimes another.

196. Q. What is the cause of Wind?

A. This has not been satisfactorily accounted for; but we may justly consider it as a wise dispensation of Providence; for if the atmosphere were not purified by winds, in the same manner as the waters of the sea are by the tides, it would be unfit for respiration, and both would become unfriendly to life.

Writing.

197. Q. By whom was writing invented?

A. So wonderful is the invention, that it has been ascribed to a Divine origin. God himself gave Moses the ten Commandments of the law, written on two tables of stone. Cadmus, king of Thebes, is said to have brought letters from Phœnicia into Greece, about 1519 years before the birth of Christ. The aboriginal Americans were so ignorant of writing, that when they saw a person reading, they imagined that the paper spoke.

198. Q. Is not the art of writing a distinguished blessing?

A. Like every other blessing, it may be misapplied; but without it, mankind would never have risen to that state of improvement in knowledge that they now have. It is the soul of commerce, the picture of the past, the regulator of the future, and the messenger of the thoughts. In short, it is the foundation all learning, and of every thing that exalts and refines human nature.

Zoology.

199. Q. What is Zoology?

A. Zoology is that branch of natural history, which treats of living creatures, and gives their general and specific characters, their descriptions and habits.

200. Q. Into how many classes are animals divided?

A. Linnæus, whose diatribution is chiefly followed, divides animals into six classes. 1. *Mammalia*, including all animals that suckle their young. 2. *Aves*, or birds. 3. *Amphibia*, or amphibious animals. 4. *Pisces*, or fishes. 5. *Insecta*, or insects. 6. *Vermes*, or worms.

201. Q. What an entertaining study this must be!

A. The history of animated nature is indeed highly interesting, and in a Catechism on this subject, I trust you will find much valuable matter: be assured, that from the highest to the lowest class,—